



The 35th Chinese Control Conference

Plenary Panel Session 2

Title: Development and Prospect of UAVs

Time: 10:50-12:20, July 29 (Friday)

Chair: Professor Jie Chen, Beijing Institute of Technology, China

Abstract: The conference proudly presents the plenary panel session on Development and Prospect of UAVs. We are honored to be able to invite four prominent professors in this field to be panelists. The UAV first appeared in 1920s, was used as the training target. Decades have passed, what achievements we have gained in the field of UAVs, and what's the new direction for the further development of this field, panel members will share their special experiences and visions on this issue with audience through effective face-to-face dialogues.

Panelists:



**Prof. Ben M. Chen, National University of Singapore (NUS),
Singapore**

Ben M. Chen is currently a Professor and Director of Control, Intelligent Systems & Robotics Area, Department of Electrical and Computer Engineering, National University of Singapore (NUS), and Head of Control Science Group, NUS Temasek Laboratories. His current research interests are in systems and control, unmanned aerial systems, and financial market modeling.

Dr. Chen is an IEEE Fellow. He is the author/co-author of 10 research monographs including H₂ Optimal Control (Prentice Hall, 1995), Robust and H_∞ Control (Springer, 2000), Hard Disk Drive Servo Systems (Springer, 1st Edition, 2002; 2nd Edition, 2006), Linear Systems Theory (Birkhäuser, 2004), Unmanned Rotorcraft Systems (Springer, 2011), and Stock Market Modeling and Forecasting (Springer, 2013). He had served on the editorial boards of a number of journals including IEEE Transactions on Automatic Control, Systems & Control Letters, and Automatica. He currently serves as an Editor-in-Chief of Unmanned Systems and a Deputy Editor-in-Chief of Control Theory & Technology.



Prof. Lihua Xie, Nanyang Technological University, Singapore

Lihua Xie received the B.E. and M.E. degrees in electrical engineering from Nanjing University of Science and Technology in 1983 and 1986, respectively, and the Ph.D. degree in electrical engineering from the University of Newcastle, Australia, in 1992. He was with the Department of Automatic Control, Nanjing University of Science and Technology from 1986 to 1989. Since 1992, he has been with the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, where he is currently a professor. He served as the Head of Division of Control and Instrumentation from July 2011 to June 2014, and the Director, Centre for E-City from July 2011 to June 2013. He held the Changjiang Professorship with South China University of Technology from 2006 to 2011.

His current research interests include networked control, multi-agent systems, sensor networks, compressive sensing, localization, and unmanned systems. He has authored/co-authored over 300 journal papers, 280 conference papers, 3 patents, and 8 books. He received the best paper awards from the 7th Asian Control Conference, the 6th World Congress of Intelligent Control and Automation, and the 6th International Conference on Information, Communications, and Signal processing. He is currently an Editor-in-Chief of Unmanned Systems and an Associate Editor of IEEE Transactions on Control Systems Technology. He served as an Editor, IET Book Series in Control, an Associate Editor of Automatica, IEEE Transactions on Automatic Control, IEEE Transactions on Circuit and Systems-II, International Journal of Control, Automation and Systems, and was also a member of the Editorial Board of IET/IEE Proceedings on Control Theory and Applications. He was a Vice Program Chair of the 54th IEEE Conference on Decision and Control, the General Chairman of the 9th International Conference on Control, Automation, Robotics and Vision and the 7th IEEE International Conference on Control and Automation, and the Program Chair of the forth IEEE International Conference on Control and Automation and the 8th International Conference on Control, Automation, Robotics and Vision.

Dr Xie is a Fellow of IEEE, a Fellow of IFAC, and an elected member of the Board of Governors of IEEE Control System Society. He was an IEEE Distinguished Lecturer from 2011 to 2014 and an appointed member of the Board of Governors of IEEE Control System Society in 2011.



Prof. Wen-Hua Chen, Loughborough University, UK

Dr Wen-Hua Chen holds Professor in Autonomous Vehicles in the Department of Aeronautical and Automotive Engineering at Loughborough University, UK, where he is leading the Autonomous Systems Laboratory. He is also the Head of Control and Reliability Research Group. Prof. Chen has a considerable experience in control and signal processing and their applications in aerospace and automotive systems. His research is featured by working in the interface between theoretic developments and practical applications, and across a number of disciplines including aerospace, automotive engineering, control, electronics, and computer science. He has made considerable contributions in the development of Nonlinear Model Predictive Control and Disturbance Observer Based Control. In the last decade, much of his effort has been spent in developing research in autonomous system technologies and their applications in unmanned aircraft systems and intelligent vehicles, covering most of the aspects from autopilots, situational awareness, decision making to system integration and verification. His unmanned vehicles related research has been widely supported by the UK government (e.g. Engineering and Physics Science Research Council) and industry.

Dr Chen received the M.Sc. and Ph.D. degrees in control engineering from Northeastern University, Shenyang, China, in 1989 and 1991, respectively. He was a Lecturer and then Associate Professor with the Department of Automatic Control, Nanjing University of Aeronautics and Astronautics, Nanjing, China before moved to UK. He joined the Department of Aeronautical and Automotive Engineering, Loughborough University, in 2000 after having held a research position and then a Lecturer in control engineering with the Centre for Systems and Control, University of Glasgow, Scotland.

Prof Chen has received Loughborough Excellence Awards for Developing Research Leadership by Loughborough University. He was awarded Charles Sharpe Beecher prize by the Institution of Mechanical Engineers, 2013, for a paper in unmanned helicopter control, and his team also won the first Royal Aeronautical Society Unmanned Aircraft Systems Innovation Award in 2012. Prof. Chen is a Chartered Engineer (CEng), a Fellow of the Institution of Mechanical Engineers, and a Fellow of the Institution of Engineering and Technology (formerly IEE). He is also a visiting Changjiang Chair Professor in Beihang University.

Prof. Gangyin Tian, Beijing ZHZ technology CO., Ltd



Gangyin Tian is the CEO of Beijing ZHZ technology CO., Ltd, one of the China's leading UAV companies. He holds the Director of Unmanned-Flight Control Research institute, Beijing Institute of Technology, China. Tian has a considerable experience in flight control and algorithm and their applications in unmanned aerial vehicle. Tian received the Bachelor degrees in aircraft design from Beijing Institute of Technology, Beijing, China, in 2005. He was a core R&D engineer in Beijing BVE technology Co., Ltd before established his own company.

In the last decade, much of his effort has been spent in developing research in modern robust control algorithm and their applications in unmanned aircraft systems. When he was in university, as a core member of Aviation Association, he began to study and research modern robust control algorithms and attempted to use his research in UAV control and engine control. In 2007, he completed the research and development of unmanned helicopter autopilot based on Hinf algorithm and its application has been successfully make an unmanned helicopter automatically and independently takeoff, land, hover and conduct path planning.

Tian established a company in 2008, which he made considerable contributions in the commercialization of the unmanned helicopter autopilot. In 2010, he was responsible for the research and development of the 300-kilogram coaxial unmanned helicopter and has been successfully make it become autonomous drone in late 2010. This unmanned helicopter holds a number of invention patents, developed and applied in multiple industries. In 2013, he was in charge of 3 tons of unmanned helicopter research and development program. The flight time of this drone can be up to 30 hours, which is the longest fight time of an unmanned helicopter, currently.